

What is claimed is:

1. A mixer circuit comprising:

an amplification unit having an input terminal and an output terminal, and amplifying a signal applied to the input terminal to output it to the output terminal;

5 a mixing unit having first, second and third input terminals, and first and second output terminals, the mixing unit mixing signals respectively applied to the first and second input terminals with a signal applied to the third input terminal, to respectively output the mixed signals to the first and second output terminals;

10 a capacitor connected between the output terminal of the amplification unit and the third input terminal of the mixing unit; and

a current source for providing a specific quantity of current to the third input terminal of the mixing unit such that the quantity of current flowing through the third input terminal of the mixing unit is substantially larger than the quantity of current flowing through the amplification unit.

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2. The mixer circuit according to claim 1, wherein the amplification unit includes:

an amplification element having a first terminal that forms the input terminal, a second terminal that forms the output terminal and a third terminal, wherein the 20 quantity and direction of current flowing from the second terminal to the third terminal are varied on the basis of the level of a voltage applied to the first terminal;

a load impedance connected between the second terminal of the amplification element and a first voltage source; and

a degeneration impedance connected between the third terminal of the amplification element and a second voltage source.

3. The mixer circuit according to claim 2, wherein the amplification unit
5 further includes a capacitor connected between the first and second terminals of
the amplification element.

4. The mixer circuit according to claim 1, wherein the mixing unit
includes:

10 a first amplification element having a first terminal that forms the first input
terminal, a second terminal that forms the first output terminal and a third terminal,
wherein the quantity and direction of current flowing from the second terminal to
the third terminal are varied on the basis of the level of a voltage applied to the first
terminal;

15 a second amplification element having a first terminal that forms the second
input terminal, a second terminal that forms the second output terminal, and a third
terminal connected to the third terminal of the first amplification element to form
the third input terminal, wherein the quantity and direction of current flowing from
the second terminal to the third terminal are varied on the basis of the level of the
20 voltage applied to the first terminal; and

first and second load impedances connected between the second terminals
of the first and second amplification elements and a voltage source, respectively.

5. The mixer circuit according to claim 1, wherein the current source includes an LC resonance circuit.

6. A mixer circuit comprising:

5 an amplification unit having an input terminal and an output terminal, and amplifying a signal applied to the input terminal to output it to the output terminal; a mixing unit having first, second and third input terminals, and first and second output terminals, the third input terminal being connected to the output terminal of the amplification unit, the mixing unit mixing signals respectively applied 10 to the first and second input terminals with a signal supplied to the third input terminal, to respectively output the mixed signals to the first and second output terminals; and a current source for providing a specific quantity of current to the third input terminal of the mixing unit.

15 7. The mixer circuit according to claim 6, wherein the amplification unit includes:

an amplification element having a first terminal that forms the input terminal, a second terminal that forms the output terminal and a third terminal, wherein the 20 quantity and direction of current flowing from the second terminal to the third terminal are varied on the basis of the level of a voltage applied to the first terminal; and

a degeneration impedance connected between the third terminal of the amplification element and a second voltage source.

8. The mixer circuit according to claim 7, wherein the amplification unit further includes a capacitor connected between the first and second terminals of the amplification element.

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9. The mixer circuit according to claim 6, wherein the mixing unit includes:

a first amplification element having a first terminal that forms the first input terminal, a second terminal that forms the first output terminal and a third terminal, 10 wherein the quantity and direction of current flowing from the second terminal to the third terminal are varied on the basis of the level of a voltage applied to the first terminal;

a second amplification element having a first terminal that forms the second input terminal, a second terminal that forms the second output terminal, and a third 15 terminal connected to the third terminal of the first amplification element to form the third input terminal, wherein the quantity and direction of current flowing from the second terminal to the third terminal are varied on the basis of the level of the voltage applied to the first terminal; and

first and second load impedances connected between the second terminals 20 of the first and second amplification elements and a voltage source, respectively.

10. A mixer circuit comprising:

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an amplification unit having an input terminal and an output terminal, and amplifying a signal applied to the input terminal to output it to the output terminal; and

a mixing unit having first, second and third input terminals, and first and

5 second output terminals, the third input terminal being connected to the output terminal of the amplification unit, the mixing unit mixing signals respectively applied to the first and second input terminals with a signal applied to the third input terminal, to respectively output the mixed signals to the first and second output terminals,

10 wherein the amplification unit includes:

an amplification element having a first terminal that forms the input terminal, a second terminal that forms the output terminal and a third terminal, the quantity and direction of current flowing from the second terminal to the third terminal being varied on the basis of the level of a voltage applied to the first terminal;

15 a degeneration impedance connected between the third terminal of the amplification element and a second voltage source; and

a capacitor connected between the first and second terminals of the amplification unit.

20 11. The mixer circuit according to claim 10, wherein the mixing unit includes:

a first amplification element having a first terminal that forms the first input terminal, a second terminal that forms the first output terminal and a third terminal, wherein the quantity and direction of current flowing from the second terminal to

the third terminal are varied on the basis of the level of a voltage applied to the first terminal;

5 a second amplification element having a first terminal that forms the second input terminal, a second terminal that forms the second output terminal, and a third terminal connected to the third terminal of the first amplification element to form the third input terminal, wherein the quantity and direction of current flowing from the second terminal to the third terminal are varied on the basis of the level of the voltage applied to the first terminal; and

10 first and second load impedances connected between the second terminals of the first and second amplification elements and a voltage source, respectively.

12. The mixer circuit according to claim 11, wherein the mixing unit further includes each of capacitors which is connected between the first and second terminals of each of the first and second amplification elements.

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13. A mixer circuit comprising:

an amplification unit having an input terminal and an output terminal, and amplifying a signal applied to the input terminal to output it to the output terminal; and

20 a mixing unit having first, second and third input terminals, and first and second output terminals, the third input terminal being connected to the output terminal of the amplification unit, the mixing unit mixing signals respectively applied to the first and second input terminals with a signal supplied to the third input

terminal, to respectively output the mixed signals to the first and second output terminals,

wherein the mixing unit includes:

- a first amplification element having a first terminal that forms the first input terminal, a second terminal that forms the first output terminal and a third terminal, the quantity and direction of current flowing from the second terminal to the third terminal being varied on the basis of the level of a voltage applied to the first terminal;
- a second amplification element having a first terminal that forms the second input terminal, a second terminal that forms the second output terminal, and a third terminal connected to the third terminal of the first amplification element to form the third input terminal, the quantity and direction of current flowing from the second terminal to the third terminal being varied on the basis of the level of the voltage applied to the first terminal;
- 15 first and second capacitors, the first capacitor being connected between the first and second terminals of the first amplification element, the second capacitor being connected between the first and second terminals of the second amplification element; and
- 20 first and second load impedances connected between the second terminals of the first and second amplification elements and a voltage source, respectively.